Modulating exhaust and supply fans provide a means of maintaining proper variable air volume control (VAV) as well as building pressurization. As buildings have become more energy efficient (i.e., built tighter), the "natural relief" rate has building pressurization. As buildings have become more energy efficient (i.e., built tighter), the "natural relief" rate been significantly reduced.

In an attempt to further reduce energy costs, control systems can be programmed to reduce the flow from the exhaust and supply fans for short periods of time. This load reduction practice must stay within the limits of building pressurization control and can avoid a temporary loss of space temperature control that results from load shedding.

In exhaust/supply fan modulation control schemes, the supply fan drive and motor is controlled by the duct static pressure regulator, while the outside/return air dampers are positioned by the economizer/supply air temperature controller. Exhaust fan capacity is then modulated to stabilize building pressure at a slightly positive value.

Application Considerations.
• Placement of the indoor static sensor should provide a representative, stable signal. Entrances, docks and other areas where large, sudden static pressure changes may occur should be avoided.
• Shielding the outdoor reference sensor from wind and rain is critical for proper operation.
• If the exhaust fan is equipped with modulating devices such as a drive, a two-position exhaust air damper should be used to prevent outside air infiltration through the exhaust when the exhaust fan is not running.
• Drives with PID control function can be employed to minimize hardware and installation costs.

As illustrated in Figure 1, space pressurization control is simple and reliable. In the arrangement shown, a sensitive static pressure controller directly senses the difference between the reference space and outside pressures.
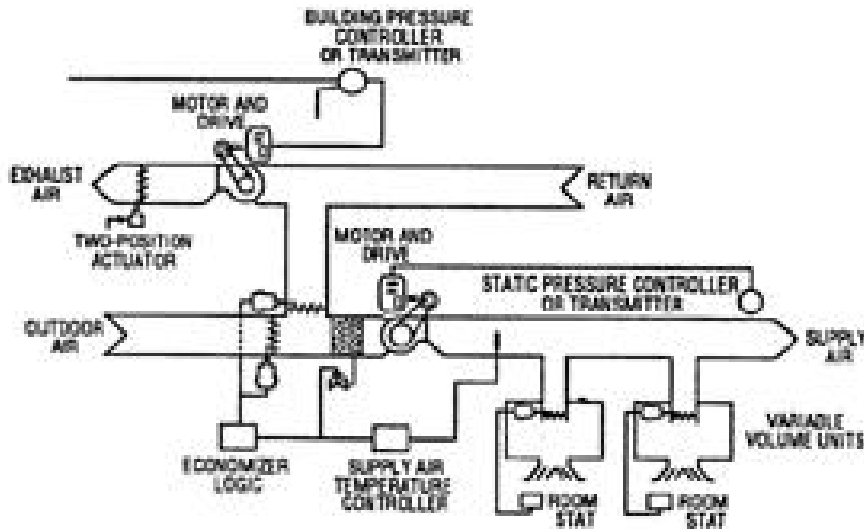In turn, this controller, with the drive and motor, regulates the speed of the exhaust fan.

Figure 1.